

**APPLIES TO:**

WORK LOAD ANALYSIS

**SUMMARY**

This article explains how to Perform the WORK LOAD ANALYSIS.

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## WORK LOAD ANALYSIS:

1. Execute ST03N in expert mode and select the duration in days/weeks months. Do not arrive to a conclusion based on daily/weekly data of the instance. It displaying the following.
2. It displays the EWA (Early watch alert session) and work load based on transactions.
3. The expensive programs, expensive processes and expensive users.
4. Response time distribution specific the response time comparison with dialog steps(in seconds) where average response time in milliseconds .
5. It displays the top loaded transactions to identify the expensive transactions.
6. It displays the time profile along with dialog steps to define peak and off peak hours.
7. It displays the memory use transactions (used to display reports/programs/modules and memory consumption by the transactions and users).
8. User and settlement statistics to display the list of users along with accessed transactions and the number of dialog steps on each transaction.
9. It is also used for auditing the users which can specify whether the user has accessed that transaction code on the specific day/week/month.
10. **Front end statistics:** It specifies the desktop hostname(terminals) along with transferred data i.e. input/output from each terminal.
11. **Spool statistics:** It displays the number of spool requests, amount of data printed number of pages and spool response time.

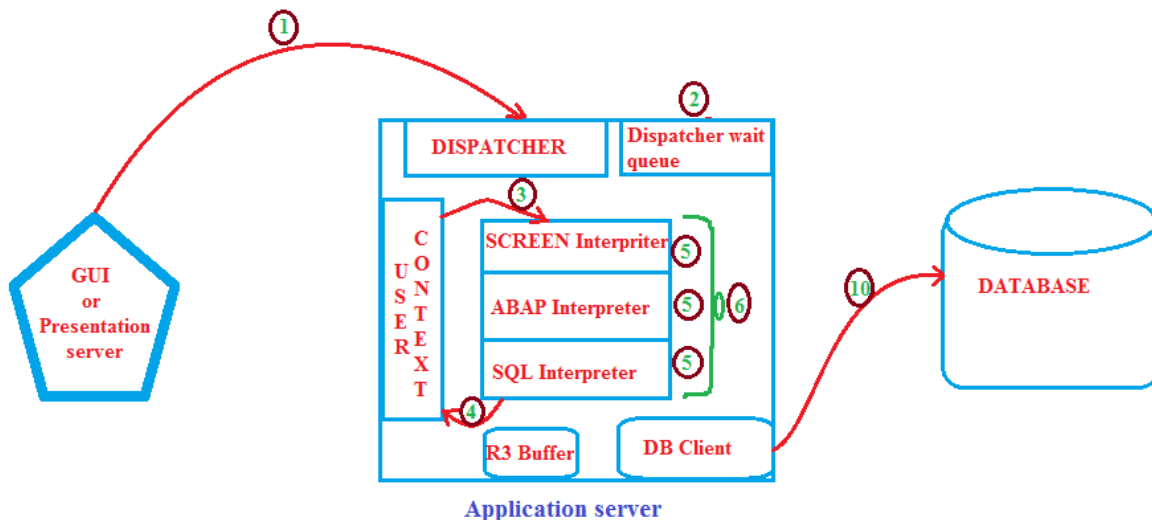
**RESPONSE TIME:**

The time taken by the user request to process the user’s task right from the dispatcher to database and back to the user. The SAP response time is makeup of following components.

**Response Time = Wait Time + Execution time.**  
**Execution Time = Response Time – Wait Time.**

Where **Execution Time** = +Roll times (Roll in and Roll Out) +  
 ABAP processing Time (it includes CPU Time) +  
 Load Time for Programs, Screens, and graphical interface (LG Time) +  
 Enque Time +  
 CPIC/RFC Time +  
 Database Time

→ The CPU time is not an additive component of the response time, but the total of the individual components of the utilized CPU time.  
 →SAP GUI Time is not part of the response time. (because the request is not yet reached dispatcher).



### **1. GUI Time:**

The time taken by the user request to reach the dispatcher is referred as GUI time, If GUI time > **200ms** then it is considered as expensive then consider the following issues.

**GUI Issue** : Update GUI (Uninstall and reinstall GUI →Due to virus)

**Network Issue:** Ensure that necessary bandwidth is available (check router/Switch hub /network bandwidth)

**Desktop Issue:** Desktop resources such as hard disk memory and CPU bottle necks. (Upgrade desktop).

**Network Congestion:** Ensure that there is a dedicated network for SAP users. If the same network is used by WEB, email, print then network congestion occurs.

### **2. Wait Time:**

The amount of the time the user requests waits in the queue for allocating a process. If **wait time > 50ms** or **10% average response time**. Then it is considered as expensive. If expensive then consider the following issues.

- Work processes are not sufficient (increase based on application monitor and available resources (ST07), 5 to 10 users are processed by a process).
- Work processes are processing expensive programs are in the private mode (restrict the processes that can go into private mode by using parameter rdisp/wppriv\_max\_no = 1 or 2 and rdisp/max\_priv\_time = 60sec).
- Configure the memory parameters.
- Identify the expensive programs and reschedule them to off peak hours.

### **3. Roll in time:**

The time taken by the work process to roll the user context into its task handlers is referred as **roll in** time.

### **4. Roll out time:**

The time taken by the work process to roll out the user related information into user context before sending response to the user. If roll in/roll out time > **50ms** then it considered as expensive. If expensive then consider the following issues.

- Reduce the user authorization (SU01 or PFCG).
- User parameters and common user attributes (CUA).

### **5. CPU time:**

The amount of time the work process utilizes the CPU resources while processing the request is referred as CPU time. If CPU time is > **40% Execution time** (Response time – Wait time) then it considers as expensive then consider the following issues.

Example: 40% (600 - 60) ==> 40%540 = 210ms.

- Identify the expensive ABAP programs in **ST03N** and if required execute SE30/ST30 for runtime analysis of ABAP programs (Developers task).
- Monitor the CPU utilization in ST06 and ensure that idle time is always greater than 30%.
- CPU time is part of processing time, so it is not considered for calculating average response time.

### **6. Processing time:**

The time taken to process the user request if processing time is greater than 2\*CPU time (Twice the amount of CPU time) then consider processing of screens, ABAP, SQL statements are expensive.

- Tune ABAP programs, ABAP screens and SQL statements.
- Mostly this time is not considered for fine tuning, but it is part of response time.

### **7. LG Time:**

The time taken to load and generate the response from the buffers or from the process after fetching the content from database. If Load and generation time > **200ms**, then it considered as expensive. If expensive then consider the following issues.

- Processing the response from buffers or loads and generate the response from database is expensive.
- Monitor buffers hit ratio in ST02 and ensure that buffer hit ratio is always greater than 98%.
- If required trace the users/processes for buffer trace in ST05.
- Run SGEN to compile the programs after upgrade or support package application.

### **8. RFC/CPIC time:**

It should be as minimal as possible. It is always an overload, check the gateway and RFC connections if required.

→ If it is periodical then check the interface/gateway or the target system resources.

→ If required trace the user/process in ST05 RFC trace.

### **9. ENQUE time:**

The time taken by the dialog process to communicate with enqueue process and obtain a lock on that record is referred as enqueue time. It is also time taken by the dialog process to communicate with message server and message server with enqueue process, when the dialog process is initiated from dialog instance.

If enqueue time > **5ms** on central instance and > **100ms** on dialog instance then it is considered as expensive. If expensive then consider the following issues.

→ Increase the enqueue work process if required.

→ Increase the size of enqueue table if required. (When enqueue lock table overflows)

→ If required trace the process or user in **ST05** (enqueue trace).

### **10. Database time:**

The time taken by the process to reach the database and get the response from database is referred as database time. If database time > **40% execution time** i.e. (response time – wait time) then it is considered as expensive. If expensive then consider the following issues.

→ Database buffers are not sufficient (increase buffers). Check for the database buffer hit ratio in **ST04** which should be **>= 94%**

→ Check for resource bottle necks on database (check memory and CPU utilization) in ST06/ST04/OS monitor.

→ There may be missing indexes which can be called and recreated in DB02 or SE14.

→ Database statistics are outdated (schedule database stats job in DB13).

→ Database has to be reorganized (reorganize the database using BR TOOLS).

→ There may be an expensive SQL statements which can be traced in ST05-SQL trace.

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